SEMICONDUCTOR LIGHT EMITTING DEVICE

ABSTRACT OF THE DISCLOSURE

A light emitting diode (LED) including a combination of features that enable the LED to produce a high-brightness predetermined radiation pattern. The combination of features enable the LED to function cooler and more reliably at a higher drive currents and elevated ambient temperatures, and therefore emit light of increased brightness, without overheating, and to have a particular radiation pattern. In particular, a surface mount that is capable of operating at high drive currents and high ambient temperatures is disclosed. The LED comprises a surface mount package having a metal lead frame having mass sufficient to provide low thermal resistance, at least one anode contact pad and at least one cathode contact pad. The LED also includes a reflector positioned within the package, a semiconductor die and an optional focusing dome. The semiconductor die comprises a transparent substrate and a semiconductor component and is positioned within the package so that the semiconductor component and the substrate are arranged side-by-side over the reflector (flop-chip). Alternatively, the die is positioned within the package so that the substrate is on top of the semiconductor component (flip-chip). The optional focusing dome is operative to refract light emitted from the semiconductor die and light reflected from the reflector to create a predetermined radiation pattern.